REMARKS/ARGUMENTS

Favorable reconsideration of the present application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-5 are currently pending in this application, and Claims 1 and 3-5 are amended without the introduction of any new matter to correct a grammatical informality and to better reflect standard U.S. claim terminology.

In the outstanding Office Action the Specification was objected to; Claim 3 was rejected under 35 U.S.C. §112, second paragraph, for not particularly pointing out and distinctly claiming the subject matter which the Applicants regard as the invention; Claims 1, 2, 4, and 5 were rejected under 35 U.S.C. §103(a) as unpatentable over Yamaga et al. (U.S. Patent No. 5,578,132, hereinafter Yamaga); Claims 1, 2, 4, and 5 were rejected under 35 U.S.C. §103(a) as unpatentable over Miyagi et al. (U.S. Patent No. 5,207,573, hereinafter Miyagi); and Claims 1, 2, 4, and 5 were rejected under 35 U.S.C. §103(a) as unpatentable over Uchiyama et al. (U.S. Patent No. 5,902,406, hereinafter Uchiyama).

With respect to the objection of the Specification, Applicants have adopted the suggestion in the Office Action and added section headings and corrected the informality on page 10 of the Specification.

With respect to the rejection of Claim 3 under 35 U.S.C. §112, Applicants have amended "and/or" to recite "or." Therefore, Applicants respectfully submit that amended Claim 3 complies with the requirements of 35 U.S.C. §112 and is in condition for allowance. A similar amendment is made to Claim 4.

Applicants respectfully traverse the outstanding prior art based rejections because the outstanding Office Action fails to provide a *prima facie* case of obviousness because it relies on prior art that does not teach or suggest every limitation of independent Claim 1.

To establish a *prima facie* case of obviousness, M.P.E.P. §2143 requires that three criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the references teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim elements.

Claim 1 is directed to a thermal treatment system for semiconductors that includes an outer tube, including silicon carbide, and which has an upper portion closed and a lower portion opened, and has a flange formed on an outer peripheral side of the lower portion. There is a base, which supports the lower portion of the outer tube and provides a hermetic seal between the lower portion of the outer tube and the base. There is a lid, which is provided so as to selectively open and close an opening formed in a central portion of the base. There is a reactor wall, which surrounds an outer peripheral wall and an upper wall of the outer tube and has a heater provided on an inner side. An annular sealing member and an annular supporting member are interposed between the outer tube and the base so that the supporting member is located around an outer peripheral side of the sealing member, and wherein the supporting member has an effective heat transfer coefficient of 50 to 2,000 $W/(m^2 \cdot K)$.

With respect to the rejection of Claim 1 as unpatenable over Yamaga, Applicants respectfully submit that Yamaga does not teach or suggest every element of Claim 1. Claim 1 recites "an outer tube, comprising silicon carbide." Yamaga does not teach or suggest using silicon carbide. Instead, the outer tube of Yamaga is quartz. See Yamaga at col. 10, lines 40-41.

The fact that the outer tube of claim 1 comprises silicon carbide is important because:

> [T]he use of silicon carbide has a problem that fracture is easily caused due to tensile stresses or bending stresses mainly generated at three locations A, B

> and C shown in Fig. 7 of Patent Document 2 (corresponding to Fig. 4 of the application) since silicon carbide has a higher thermal expansion coefficient and a higher thermal conductivity than quartz glass. The use of silicon carbide also has a problem that an O-ring, which is normally interposed between the outer tube and a base, is apt to be seized because of silicon carbide having a high thermal conductivity, and the gas-sealing ability is therefore impaired easily.[1]

The Applicants claim an improvement in a thermal treatment system directed toward solving these problems. Yamaga does not address these problems associated with using silicon carbide. Rather, Yamaga is directed toward precluding corrosion of the manifold by contact of corrosive exhaust gas.[2] Yamaga uses quartz because it is resistant to corrosion.[3] Clearly, there is no reasonable basis to suggest that the artisan would substitute silicon carbide for the disclosed quartz.

Accordingly, as Yamaga does not teach or suggest that silicon carbide should be substituted for Quartz as the material of the outer tube, no *prima facie* case of obviousness has been established and the rejection based upon Yamaga should be withdrawn.

Furthermore, Applicants agree with the Office Action that Yamaga does not teach or suggest the claimed "...wherein the supporting member has an effective heat transfer coefficient of 50 to 2,000 W/(m^2·K)."

Yamaga discloses a sectional positioning ring being made of Teflon.[4] The Office Action states that it would be obvious for a person of skill in the art to choose a material with a suitable heat transfer coefficient. Applicants respectfully traverse this position because the only indication that the material should have a suitable heat transfer characteristic is in applicant's specification and cannot be used as "prior art."

In addition, it is well established that when particular claimed features are disclosed as solving particular problems and providing advantages, as in the present specification, the

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[1] Specification, page 2, lines 5-16.
[2] Yamaga, col. 3, lines 46-49.
[3] Yamaga, col. 10, lines 40-42.
[4] Yamaga, col. 11, lines 40.

doctrine of design choice cannot be relied upon as a substitute for a clear and convincing showing of motivation that would logically have led the artisan to have made the proposed modification. See In re Chu, 36 USPQ2d 1089, 1094 (Fed. Cir. 1995).

It is Applicants, not Yamaga, who disclose that when the structure of the supporting member is selected to have an effective heat transfer coefficient in the claimed range, there is no limitation to the structure of the supporting member.[5] This benefit resulting from the claimed "...wherein the supporting member has an effective heat transfer coefficient of 50 to 2,000 W/(m^2·K)" shows that it would not be an obvious design choice for a person of ordinary skill in the art to select a known material with a heat transfer coefficient in the claimed range.

Furthermore, the Office Action fails to identify concrete evidence to support the conclusion that "it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the support member of Yamaga."[6] Such an erroneous attempt to substitute a subjective conclusion of obviousness for actual evidence thereof was recently considered and found wanting in In re Zurko, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) as follows:

> With respect to core factual findings and determination of patentability, however, the [PTO] cannot simply reach conclusions based on its own understanding or expertise -- or on its assessment of what would be basic knowledge or common sense. Rather, the [PTO] must point to some concrete evidence in the record in support of these findings.

In view of the above-noted distinctions, Applicants respectfully submit that Claim 1 (and its dependent Claims 2-5) patentably distinguish over Yamaga.

With respect to the rejection of Claim 1 as unpatenable over Miyagi, Applicants respectfully submit that Miyagi, like Yamaga, does not teach or suggest every element of

[5] Specification, page 10, lines 4-7.
[6] Office Action of November 15, 2004, page 4.

Claim 1. In this regard, Miyagi also does not teach or suggest the claimed "an outer tube, comprising silicon carbide."

On the contrary, Miyagi is like Yamaga in teaching that the outer tube should be quartz.[7] For at least the reasons given above for the Yamaga, Miyagi does not teach or suggest the claimed "an outer tube, comprising silicon carbide" and no valid *prima facie* case of obviousness has been set forth.

Furthermore, Applicants agree with the Office Action that Miyagi does not teach or suggest the claimed "...wherein the supporting member has an effective heat transfer coefficient of 50 to 2,000 W/(m^2·K)."

Miyagi is again like Yamaga in teaching a sectional positioning ring being made of Teflon.[8] The Office Action states that it would be obvious for a person of skill in the art to choose a material with a suitable heat transfer coefficient. Applicants respectfully traverse this position for at least the same reasons as given above for Yamaga.

In view of the above-noted distinctions, Applicants respectfully submit that Claim 1 (and its dependent Claims 2-5) patentably distinguish over Miyagi.

With respect to the rejection of Claim 1 as unpatenable over Uchiyama, Applicants respectfully submit that Uchiyama does not teach or suggest every element of Claim 1. Uchiyama does not teach or suggest the claimed "...wherein the supporting member has an effective heat transfer coefficient of 50 to 2,000 W/(m^2·K)."

Applicants agree with the Office Action that Uchiyama does not teach or suggest the above-noted element. Applicants traverse the argument in the Office Action that it would be obvious for a person of skill in the art to choose a material with a suitable heat transfer coefficient for at least the same reasons give for Yamaga.

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[7] Miyagi, col. 3, lines 24-28.
[8] Miyagi, col. 5, lines 25-29.

Furthermore, Uchiyama discloses a different solution to the above-noted problems of using silicon carbide. Uchiyama discloses "padding of a silicon carbide material can be formed at the corner of the joined portion between the circumferential wall and the flange of the outer tube to prevent thermal stress from concentrating on the corner of the joined portion between the circumfrential wall and the flanges avoiding fracture of the outer tube."[9] Uchiyama also discloses "the outer tube is primarily supported by having the inner circumferential portion of the flange inside the seal ring directly or indirectly contacted with the base portion ...Since flange 72c is cooled through the inner circumfrential portion, tensile stress applied to an outer periphery and an upper surface A of the flange 72c and bending stress applied to the lower portion C of the circumferential wall 72a can be reduced to prevent the outer tube 72 from being fractured."[10] Neither of the two approaches of Uchiyama teach or suggest the claimed "...wherein the supporting member has an effective heat transfer coefficient of 50 to 2,000 W/(m^2·K)."

In view of the above-noted distinctions, Applicants respectfully submit that Claim 1 (and its dependent Claims 2-5) patentably distinguish over Uchiyama.

[9] Uchiyama, col. 3, lines 47-53.
[10] Uchiyama, cols. 3 line 59 to col. 4, line 6.

Consequently, in view of the above amendments and comments, it is respectfully submitted that the outstanding rejection is overcome and the pending claims are in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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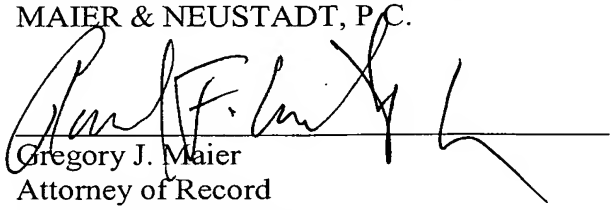

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